Space Weather Forecast

Issued on Friday, 24 March 2023 at 01:32 Local

This forecast provides a four day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales

---

Space Weather Forecast Headline: Further Minor/Moderate Geomagnetic Storms expected with a chance of Moderate storms at first. Daily Slight Chance of R1/R2 Radio Blackouts.

Solar Activity: AR3256 in the southeast quadrant remains the largest and most complex region on the disc, but despite this solar activity has been Low over the past 24 hours. AR3256 generated the largest flare of the period, which was only a low level Common class flare at 23/0130 UTC. After this there was a generally decreasing trend in x-ray activity, with the remaining four numbered sunspot regions all small, weak and magnetically stable.
No Earth directed Coronal Mass Ejections have been observed in available imagery.

Solar Wind / Geomagnetic Activity: The solar wind, as measured was initially reflective of gradual easing of a fast wind regime. This gave way to very disturbed solar wind conditions, most likely from the arrival of a coronal mass ejection (CME) that left the Sun on 20th March. The solar wind was predominantly at slightly elevated levels, 440-490 km/s, but with brief peaks into elevated levels, the highest 513 km/s at 23/1411 UTC. The strength of the solar winds magnetic field was weak and steady until approximately 23/0600UTC, then gradually increased to reach strong levels through the afternoon and remained there for the rest of the day. The important north-south component of the solar wind became predominantly negative after approximately 23/0600 UTC, and mostly strongly negative from late afternoon.
The net result of the above solar wind measures was an increase from initially Quiet levels of geomagnetic activity to Minor Storm to Moderate storm levels from 23/0900 UTC, with the Moderate storm levels at 23/1200-1500 and 2100-2400 UTC

Energetic Particles / Solar Radiation: The high energy proton flux (greater than 10MeV) as measured at GOES16 is now at Background levels.

Four-Day Space Weather Forecast Summary

Solar Activity: Very Low or Solar activity is expected, with a daily slight chance of isolated Moderate-class flares, mainly from the largest sunspot or from one of several returning regions due onto the disc form the far-side in the period.

Solar Wind / Geomagnetic Activity: There were previously two CMEs featuring in the forecast, and they may have combined to form the probable CME effects that are now occurring. The combination of the residual CME effects and the arrival of coronal hole influence will maintain enhanced geomagnetic activity through most of the forecast period.

Initial G2-G3 Moderate/Strong geomagnetic storm conditions are expected, these gradually declining to Active to G1/Minor storm conditions overnight and during tomorrow (25th), but with a chance of isolated G2/Moderate storm conditions due to the arrival of the HSS from CH86/-.
From day 3 (26th) a gradual decline to Unsettled to Active conditions is expected.

Issued by Met Office Space Weather Advisor, Tel: +44 (0) 330 135 4254 Email: moswoc@metoffice.gov.uk

© Crown Copyright 2023. All Rights Reserved.

Met Office Space Weather Forecast

Energetic Particles / Solar Radiation: High energy (greater than 10MeV) proton flux is expected to continue close to Background, with only a slight chance of further enhancements should any significant flares occur.

Geomagnetic Storms:

Geo-Magnetic Storm Probability (Exceedance)	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Minor or Moderate	G1 to G2	Yes	100	70	40	10
Strong	G3	Yes	80	30	5	1
Severe	G4	No	1	1	1	1
Extreme	G5	No	1	1	1	1

Radio Blackouts - X Ray Flares:

X Ray Flares Probability	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	R1-R2 M Class	No	10	10	10	10
Very Active	R3 to R5 X	No	1	1	1	1

Solar Radiation Storms - (High Energy Protons):

Radiation Storms Probability (Exceedance)	Level (cm^{-2} sr^{-1} s^{-1})	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	≥ S1	No	5	5	5	5
Very Active	≥ S3 *	No	1	1	1	1
* S3 ≥ 10 MeV ≥ 1000 pfu and / or ≥ 50 MeV ≥ 10 pfu. (pfu = $cm^{-2}sr^{-1}s^{-1}$)						

Issued by Met Office Space Weather Advisor, Tel: +44 (0) 330 135 4254 Email: moswoc@metoffice.gov.uk

© Crown Copyright 2023. All Rights Reserved.